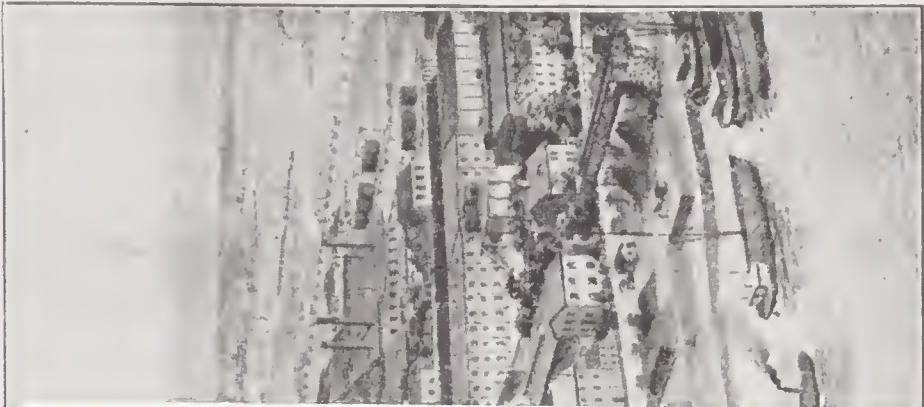


HYDRON COLOURS
ON COTTON YARN

CASSELLA COLOR COMPANY

No. 3513

LEOPOLD CASSELLA & Co., G. m. b. H., FRANKFORT o. M.



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HYDRON COLOURS ON COTTON YARN

CASSELLA COLOR COMPANY

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HYDRON COLOURS ON COTTON YARN.

The Hydron Colours are vat dyestuffs with excellent properties of fastness and with specially good levelling properties.

They are dyed with hydrosulphite, some of them also with sodium sulphide and hydrosulphite, with the addition of caustic soda lye. The caustic soda lye may be replaced by soda in some cases.

Vessels of wood, copper, iron or nickeline are used when dyeing with hydrosulphite, but when sodium sulphide is added, vessels and fittings made of copper or brass must be avoided.

The following brands are on the market:

| | |
|--------------------|-----------------------------|
| Hydron Blue G | Paste 20 %, 30 % and 40 % |
| „ „ | G Powder |
| „ „ | B Paste 20 %, 30 % and 40 % |
| „ „ | B Powder |
| „ „ | R Paste 20 %, 30 % and 40 % |
| „ „ | R Powder |
| Hydron Dark Blue G | Paste 20 % and 40 % |
| „ „ „ | G Powder |
| Hydron Violet B | Paste 20 % and 40 % |
| „ „ | B Powder |
| „ „ | R Paste 20 % and 40 % |
| „ „ | R Powder |
| Hydron Olive G | Paste 40 % |
| „ „ | G Powder |
| „ „ | B Paste 40 % |
| „ „ | B Powder |
| Hydron Brown OG | Powder |
| „ „ | OB Powder |
| Hydron Yellow G | Paste 20 % |

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DISSOLVING THE HYDRON COLOURS.

Paste Products: The Hydron Blue and Violet brands in paste form may be added straight to the dyebath. The dyestuff mixed with warm water is added to the warm bath together with the requisite quantities of alkali, whereupon the sodium sulphide and hydrosulphite are added whilst stirring, as described in full in the following dyeing directions. After the addition of the hydrosulphite the dyestuff dissolves rapidly.

Hydron Yellow Paste and Hydron Olive Paste are diluted with about 5 to 10 times their weight of water free from lime, then reduced and dissolved by the addition of the quantity of hydrosulphite and lye requisite for the dyeing.

Powder Products: The dyestuff is mixed to an even paste with about one-half or the same quantity of cold to lukewarm water free from lime; there should further be added about $\frac{1}{2}$ gallon methylated spirits per 1 gallon water for the purpose of a quicker and more even mixing, especially in the case of Hydron Blue and Hydron Violet. The paste thus obtained is diluted with about 10 times its weight of cold water.

The Hydron Blues and Hydron Olives may then be added straightaway to the dyebath; the other powder products, however, after having been made into a paste, are mixed with the quantity of hydrosulphite and caustic soda lye necessary for dyeing, and thus brought into solution.


DIRECTIONS FOR DYEING.

The yarns must be well wetted previous to the dyeing, and are best boiled in a kier with soda or caustic soda lye. For pale, bright shades it is necessary to first bleach the yarn.

For the dyeing, ordinary dye-vats or tubs of wood, copper or iron are used, but when dyeing Hydron Blue according to the most frequently followed method with sodium sulphide, copper vessels cannot be used. For heating the liquor, indirect steam is best used, and it is advisable to adjust a double set of pipes, as described on page 66 of our "Manual of Dyeing", Vol. I, 2nd edition.

To ensure level shades it is very essential that the yarns after the dyeing are squeezed off well. This is best carried out by means of squeezing rollers adjusted at the narrow end of the vat. An exact sketch and description will be found on page 67 of our "Manual of Dyeing", Vol. I, 2nd edition.

The dyeing is done with the addition of the dissolving and reducing agents stated below, generally within $\frac{1}{2}$ to 1 hour in a bath of 50—60° C (120—140° F.).

A great advantage is to dye on the well-known bent iron rods of this shape  by means of which the yarn can be kept continually under the surface of the liquor; greater levelness is thus ensured and at the same time an economising of hydrosulphite, which latter decomposes quickly when exposed to the atmosphere. Straight sticks may also be used, but the yarn must be turned more frequently or best be kept under the surface of the liquor; the quantity of hydrosulphite should then also be slightly increased. Before lifting, the batch is given three more turns, then each individual stick again a few turns, squeezing it off directly and bringing it in most cases straightaway into a rinsing bath ready at hand. Rinse first cold and then once or twice hot.

In order to ensure greater brightness of shade in the case of Hydron Yellow, its dyeings are to advantage wrung off, after squeezing off, exposed to the air for 1 to 2 hours, and only then rinsed.

Mercerised Cotton Yarn is dyed and aftertreated exactly like ordinary cotton yarn. As it however absorbs the dyestuff much more rapidly than ordinary yarn, it is advisable in every case to add to the bath some monosolvol or Turkey-red oil, for lighter shades also increasing the quantities of hydrosulphite and caustic soda lye, dyeing at a low temperature to commence with and heating the bath slowly.

The sodium sulphide process has proved especially useful for dyeing with Hydron Blue and Hydron Violet yarns which are very tightly twisted and difficult to penetrate; the material is first boiled for $\frac{1}{4}$ to $\frac{1}{2}$ hour without adding any hydrosulphite, i. e. with only the dyestuff, sodium sulphide and caustic soda lye or soda, whereupon the bath is cooled off to 60—70° C. (140—160° F.), the hydrosulphite strewed in and dyeing completed within $\frac{1}{2}$ hour.

With a volume of water of about 20 times the weight of the goods the baths are to be charged with the following quantities calculated on the weight of the goods:

Hydron Blue.

| | |
|---------------------|------------------|
| Hydron Blue G Paste | 20%, 30% and 40% |
| " " G Powder | |
| " " B Paste | 20%, 30% and 40% |
| " " B Powder | |
| " " R Paste | 20%, 30% and 40% |
| " " R Powder. | |

a) DYEING WITH HYDROSULPHITE.

This method is preferably followed when clear and light shades are desired.

For Light and Medium Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|----------------|--------------------------------|
| Hydron Blue paste 20% | 1—15 % | 1—10 % |
| Caustic soda lye 77° Tw. | 1,5—7,5 % | 1—5 % |
| Hydrosulphite conc. powder | 1,5—7,5 % | 1—5 % |

For Deep Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|----------------|--------------------------------|
| Hydron Blue paste 20% | 15—30 % | 10—20 % |
| Caustic soda lye 77° Tw. | 7,5—15 % | 5—7,5 % |
| Hydrosulphite conc. powder | 7,5—15 % | 5—10 % |

For Light and Medium Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|----------------|--------------------------------|
| Hydron Blue powder | 0,2—3 % | 0,2—2 % |
| Caustic soda lye 77° Tw. | 1,5—7,5 % | 1—5 % |
| Hydrosulphite conc. powder | 1,5—7,5 % | 1—5 % |

For Deep Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|----------------|--------------------------------|
| Hydron Blue powder | 3—6 % | 2—4 % |
| Caustic soda lye 77° Tw. | 7,5—15 % | 5—7,5 % |
| Hydrosulphite conc. powder | 7,5—15 % | 5—10 % |

Dye the previously well boiled or bleached cotton yarn for $\frac{1}{2}$ to $\frac{3}{4}$ hour at 50—60° C. (120—140° F.), to best advantage on bent iron rods, squeeze off, rinse first cold and then if possible once or twice hot.

A considerable improvement in the brightness of the shade is ensured by finally aftertreating with 1—2% sodium perborate.

Also when aftertreating with bichrome, or bichrome and bisulphite, or by soaping boiling hot, somewhat brighter shades are obtained. By an aftertreatment with copper sulphate and bichrome the already excellent fastness to boiling and light is still further enhanced.

Fuller details regarding the aftertreatment will be found on page 11.

The dyebath must have a completely yellow appearance, until the dyeing has been completed; if this is not the case, some more hydrosulphite and if necessary also a little more lye must be added.

b) DYEING WITH SODIUM SULPHIDE AND HYDROSULPHITE.

This process comes chiefly into consideration for medium and deep shades, but may to advantage be employed also for light shades, particularly on material difficult to penetrate such as mercerised embroidery yarns (pearl yarns). For this method of dyeing, a smaller quantity of hydrosulphite is required than for the first-named process (a); this results in the cost of dyeing being reduced considerably. The following quantities are used:

For Light and Medium Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|-------------------|-----------------------------------|
| Hydron Blue paste 20 % | 2—15 % | 1,5—10 % |
| Sodium sulphide cryst. | 2—15 % | 1,5—7,5 % |
| Caustic soda lye 77° Tw. | 3—7,5 % | 1—4 % |
| Hydrosulphite conc. powder | 1—3 % | 0,4—2 % |

For Deep Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|-------------------|-----------------------------------|
| Hydron Blue paste 20 % | 15—30 % | 10—20 % |
| Sodium sulphide cryst. | 15—30 % | 7,5—15 % |
| Caustic soda lye 77° Tw. * | 7,5—15 % | 4—8 % |
| Hydrosulphite conc. powder | 3—5 % | 2—3,5 % |

For Light and Medium Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|-------------------|-----------------------------------|
| Hydron Blue powder | 0,4—3 % | 0,3—2 % |
| Sodium sulphide cryst. | 2—15 % | 1,5—7,5 % |
| Caustic soda lye 77° Tw. | 3—7,5 % | 1—4 % |
| Hydrosulphite conc. powder | 1—3 % | 0,4—2 % |

For Deep Shades:

| | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|-------------------|-----------------------------------|
| Hydron Blue powder | 3—6 % | 2—4 % |
| Sodium sulphide cryst. | 15—30 % | 7,5—15 % |
| Caustic soda lye 77° Tw. * | 7,5—15 % | 4—8 % |
| Hydrosulphite conc. powder | 3—5 % | 2—3,5 % |

Dye and aftertreat according to the details on the previous page. Until the dyeing is completed, the dyebath must have a yellow appearance; if not, some hydrosulphite and if necessary some soda lye should be added.

* For deep shades the same quantity of soda ash may be used in place of caustic soda lye, particularly if Immedial Black or Immedial Carbon be employed for saddening in the same bath.

Hydron Violet B and R Paste 20 %, 40 %.

Hydron Violet B and R Powder

are dyed according to Directions (a) and (b) as afore indicated for Hydron Blue. When dyeing with sodium sulphide, somewhat more hydrosulphite is required than is stated for Hydron Blue.

Dyeing at a low temperature of about 40° C. (105° F.) will produce somewhat more reddish shades.

To improve the brightness, the Hydron Violet shades after rinsing are soaped boiling hot (4—8 oz soap per 10 gallons liquor).

Hydron Dark Blue G Paste 20 % and 40 %.

Hydron Dark Blue G Powder.

Hydron Dark Blue G may be dyed with caustic soda lye and hydrosulphite, or with caustic soda lye, sodium sulphide and hydrosulphite. The quantity of caustic soda lye should however be somewhat increased. For the 20 % paste product about the same weight should be used as of dyestuff for the starting baths, for subsequent lots $\frac{1}{2}$ to $\frac{3}{4}$ the quantity of caustic soda lye, calculated on the weight of the dyestuff (20 % paste), is sufficient.

Hydron Dark Blue G is not to be aftertreated in any special manner.

Hydron Yellow G Paste 20 %.

For Light and Medium Shades:

For Deep Shades:

| | Starting Bath: | Additions for Subsequent Lots: | Starting Bath: | Additions for Subsequent Lots: |
|---|------------------------------------|---|-----------------------|---|
| Hydron Yellow G Paste 20 % | 2—15 % | 1,5—10 % | 15—30 % | 10—18 % |
| Caustic soda lye 77° Tw. | 2—12 % | 1—5 % | 12—24 % | 5—9 % |
| Hydrosulphite conc. powder | 2—5 % | 1—4 % | 5—10 % | 4—6 % |
| Common salt or Desiccated Glauber's salt | $\frac{1}{2}$ — $1\frac{1}{2}$ lbs | $\left. \begin{array}{l} \text{per} \\ 10 \text{ gall.} \\ \text{liquor} \end{array} \right\} 0—3 \%$ | $1\frac{1}{2}$ —3 lbs | $\left. \begin{array}{l} \text{per} \\ 10 \text{ gall.} \\ \text{liquor} \end{array} \right\} 3—6 \%$ |

Add the dyestuff reduced according to the directions on page 4 at 30—40° C. (85—105° F.) together with the above indicated quantities of hydrosulphite and lye to the bath already charged with a small quantity of these two ingredients, then the common salt in solution; hereafter dye for $\frac{1}{2}$ to 1 hour in a cold to lukewarm bath, squeeze off when the dyeing is complete, wring off evenly, expose to the air for 1 to 2 hours, and rinse.

Hydron Olive G and B Powder.

Hydron Olive G and B Paste 40 %.

Hydron Brown OG and OB Powder.

For Light and Medium Shades:

For Deep Shades:

| | Starting Bath: | Additions for Subsequent Lots: | Starting Bath: | Additions for Subsequent Lots: |
|----------------------------|-------------------|--------------------------------------|-------------------|--------------------------------------|
| Dyestuff in Powder | 0,5—3 % | 0,5—2,25 % | 3—6 % | 2,25—4 % |
| Caustic Soda Lye 77° Tw. | 4—12 % | 4—9 % | 12—24 % | 9—16 % |
| Hydrosulphite conc. powder | 2—6 % | 2—4,5 % | 6—12 % | 4,5—8 % |

Add the dyestuff reduced according to the directions on page 4 at 70—80° C. (160—175° F.) with the above indicated quantities of hydrosulphite and lye to the warm bath previously charged with small quantities of these two ingredients, stir well, and dye Hydron Olive at 50—60° C. (120—140° F.), Hydron Brown at 40—50° C. (105—120° F.), for $\frac{1}{2}$ to 1 hour, squeeze off, and rinse. In the case of Hydron Brown somewhat more reddish shades are obtained by soaping boiling hot.

Combinations of Hydron Olive and Hydron Brown with Hydron Yellow.

The products are reduced, to best advantage each separately, with the quantities of hydrosulphite and lye indicated, and dissolved. Then dye for $\frac{1}{2}$ to $\frac{3}{4}$ hour at 35—40° C. (95—105° F.), squeeze off, rinse, and soap if necessary.

When using increased quantities of Hydron Yellow, some common salt or desiccated Glauber's salt should be added in order to better exhaust the bath, as indicated on page 8.

Combinations of Hydron Olive and Hydron Brown with Hydron Blue.

Hydron Olive and Hydron Brown are reduced each separately with the quantities of hydrosulphite and lye prescribed for each, and dissolved, whereupon they are added to the dyebath at about 50° C. (120° F.) Hereafter add the quantities of dissolving agent required for Hydron Blue, and finally the Hydron Blue itself.

Dye for $\frac{1}{2}$ to 1 hour at 50—60° C. (120—140° F.), squeeze off, rinse, and soap if necessary.

Combinations of Hydron Blue and Hydron Yellow.

Charge the dyebath at about 40° C. (105° F.) with Hydron Blue and the weights of dissolving agents indicated on pages 6 and 7, then with the Hydron Yellow dissolved with the requisite quantities of hydrosulphite and lye.

Dye for $\frac{1}{2}$ to 1 hour at about 40° C. (105° F.), squeeze off, and rinse; for deeper shades add some common salt or Glauber's salt in order to make the Yellow go more readily on to the fibre.

For combinations with a larger proportion of Hydron Blue it is better to dye the yarn in the first place with Hydron Blue in the ordinary manner and after rinsing to top with Hydron Yellow in a second, cold bath.

Production of Blacks Fast to Chlorine with Hydron Blue or Hydron Dark Blue G.

Blacks of good fastness to chlorine may be produced in a very simple manner with Hydron Blue or Hydron Dark Blue, by simply bottoming with these dyestuffs and topping with Aniline Black in a fresh bath. This method is suitable more particularly for hank and loose cotton dyeing.

The bottoming is done with about 15—20% Hydron Blue G or R Paste 20%, or Hydron Dark Blue G Paste 20%, according to Method (b) on page 7. After rinsing thoroughly, the topping with Aniline Black is carried out as follows:

Charge a cold bath with

7% aniline salt

10% hydrochloric acid 32° Tw. and

5% sulphuric acid 168° Tw.;

then add (previously dissolved)

12% bichromate of soda and

3% copper sulphate.

Work for 1 hour in a cold bath, then heat gradually to 50—60° C. (120—140° F.) in the course of $\frac{1}{2}$ to $\frac{3}{4}$ hour, rinse, and soap boiling hot.

Hydron Blue on an Iron Mordant.

A very deep coppery blue such as is not obtainable by dyeing direct without an excessive amount of dyestuff may be produced by previously mordanting the cotton with iron salts and dyeing subsequently with Hydron Blue. Such shades of blue equal entirely deep Indigo shades, at the same time far excelling them in properties of fastness.

The method of working is as follows:

The boiled cotton is treated for about 20 minutes with about 1 lb copperas per 10 gallons or with a solution of pyrolignite of iron or nitrate of iron 2—4° Tw. in a cold bath to which some acetic or formic acid is to advantage added.

The goods are then wrung off or whizzed. Hereafter they are entered into a lukewarm bath containing 1—1½ lbs soda ash per 10 gallons, and treated for about 10 minutes. After rinsing thoroughly, they are then dyed with Hydron Blue, to best advantage with soda lye or soda and hydrosulphite according to the directions on page 6.

Saddening of Hydron Blue Shades.

For saddening Hydron Blue in order to obtain more covered shades, Hydron Dark Blue G is the product best suited.

For this purpose Immedial Colours may however also be used, of which Immedial Black V extra, Immedial Brilliant Black 5BV conc., Immedial Brilliant Carbon F and Indo Carbon S deserve the preference; these are dissolved in the customary manner with sodium sulphide, and may be added straight to the Hydron Blue bath.

The dyeing in such case is best carried out according to the sodium sulphide-hydrosulphite process, carbonate of soda being to advantage used for the purpose instead of caustic soda lye.

Combinations of Hydron Blue and Indigo.

Indigo and Hydron Blue may be dyed together in one bath, but in such case it is an advantage to work at a somewhat lower temperature, say at about 40° C. (105° F.). The fact has moreover to be considered that $\frac{3}{4}$ to $\frac{4}{5}$ of the Indigo remains in the bath, whereas of Hydron Blue the greater portion is taken up by the fibre. When using fairly large quantities of Indigo it is therefore best to bottom with Hydron Blue and to top in a fresh bath with Indigo.

Treatment of Hydron Colours after the Dyeing and Rinsing.

As a rule a special aftertreatment of the dyeings produced with Hydron Colours is not required, but it must be made a point to give the dyeings a thorough rinsing or soaping finally, if possible hot.

Other methods of aftertreatment, which however come into consideration for *Hydron Blue only*, are the following:

TREATMENT WITH PERBORATE.

This aftertreatment comes into consideration for yarn, loose cotton, sliver, cops, cheeses, warps and piece-goods. Considerably brighter shades are thereby obtained possessing the same excellent fastness as those which have not been aftertreated.

The aftertreatment is carried out for 20 to 30 minutes with 1—2% sodium perborate in a bath of about 60—80° C. (140—175° F.), after which the goods are again rinsed.

The aftertreatment with a smaller quantity of perborate (about ½%) in a warm bath of only 30—40° C. (85—105° F.) is also in many cases applied in order to ensure a quicker oxidation, especially in machine-dyeing.

TREATMENT WITH BICHROME AND ACETIC ACID.

This aftertreatment effects a quicker oxidation, and is applied especially when working in packing machines.

To the cold or warm bath first 3—5% acetic acid, then 2—3% bichrome are added, and allowed to act for 10 to 15 minutes. Hereupon the goods are thoroughly rinsed.

TREATMENT WITH BICHROME AND BISULPHITE.

This treatment has the same effect on the goods as bichrome and acetic acid, but the action is somewhat more vigorous. After the rinsing, ½—1% bichrome is added to the cold or warm bath, and allowed to act for some minutes, whereupon 3—6 oz bisulphite per 10 gallons are added to the same bath, the treatment being continued for some minutes. Finally the goods are thoroughly rinsed.

TREATMENT WITH BLUESTONE AND BICHROME.

By an aftertreatment with 3% copper sulphate, 1—2% bichrome and 3—5% acetic acid the already excellent fastness to boiling and light of Hydron Blue is still further enhanced. The treatment may be carried out in a warm or a cold bath, 5 to 15 minutes being quite sufficient for this purpose. The goods are finally rinsed thoroughly.

Dyeing of Loose Cotton in Open Vessels or Kettles.

Loose cotton is dyed with the same ingredients as indicated for the respective shades on cotton yarn.

It has however to be noted that the sodium sulphide process is employed to best advantage for dyeing Hydron Blue on loose cotton, because a previous wetting of the cotton can in such case be omitted.

The bath in such case is first charged only with the caustic soda lye, or soda, sodium sulphide and dyestuff, the hydrosulphite being omitted until later. The opened cotton is then entered dry into the boiling hot dyebath, and boiled for $\frac{1}{4}$ to $\frac{1}{2}$ hour. Hereafter the bath is cooled off to about 70° C. (160° F.) by adding cold water, the hydrosulphite strewed in, and the dyeing completed within $\frac{1}{2}$ hour, the material being turned well.

The dyeing being completed, the cotton is lifted, allowed to drain off well or hydroextracted, and rinsed thoroughly. If rinsed immediately after the draining off, the rinsing is done first cold and finally as hot as possible; if the goods are hydroextracted, it is best to rinse hot straightaway.

For the other Hydron Colours it is well to wet out the cotton previously and then to dye at the temperatures indicated for cotton yarn. After the dyeing, the cotton is lifted, whizzed if necessary, and finally rinsed thoroughly.

Machine-Dyeing.

The Hydron Colours are eminently well suited for the dyeing of loose cotton, sliver, roving, cheeses and warps in apparatus.

The additions for the starting and standing baths are generally the same in machine-dyeing as afore indicated for the respective dyestuffs.

The dyeing is carried out in any kind of apparatus made of wood, iron, copper or nickeline, but for the sodium sulphide process as applied for Hydron Blue, apparatus or fittings of copper or brass should not be used.

It is important also to provide apparatus for dyeing cops, cheeses, and warp-beams with good suction arrangements in order to ensure the liquor being drawn off quickly and thoroughly by suction after the dyeing.

The goods are then rinsed well, this being carried out to best advantage warm to hot subsequent to the removal of the liquor by suction with a view to ensuring the highest degree of fastness. If a thorough removal of the liquor by suction is impossible, the goods are first rinsed cold, a little hydrosulphite and lye being added to the rinsing bath if necessary, and the goods being finally rinsed warm to hot also.

When dyeing Hydron Colours in mechanical apparatus, as in the case of other dyestuffs, pure, soft water, should be used, better results being thereby ensured than with hard water.

It is moreover absolutely necessary to boil the goods thoroughly before the dyeing, to advantage (when using soft water) with the addition of soda, Turkey-red oil or the like; if soft water is not being used, it is better to omit these ingredients.

Fuller details for dyeing in mechanical apparatus will be found on page XXIV and following pages of our book "The Cotton Colours of L C & Co".

Dyeing of Warps in the Continuous Dyeing Machine.

The Hydron Colours also may be dyed to very good advantage in the various kinds of continuous dyeing machines which have to be provided with very efficient squeezing rollers.

As a rule the dyebaths are charged in the same manner as stated for cotton yarn; all that has to be considered is that the starting baths, on account of the shorter duration of the dyeing operation, must be correspondingly stronger.

Fuller particulars will be found on page XXVIII and following pages of our book "The Cotton Colours of L C & Co" amongst the dyeing directions for Hydron Colours.

If so desired, we shall be glad to work out exact recipes on patterns and the dimensions of the vats (boxes) being sent us.

Dyeing of Linen Yarn.

Linen yarn is dyed in the same way as cotton yarn. It is advisable to add some Turkey-red oil or monosolvol to the bath. The amount of dyestuff may also be slightly reduced.

For dyeing very hard material, the sodium sulphide process is particularly well suited for Hydron Blue; boil the yarn with the dyestuff, caustic soda lye or soda and sodium sulphide without any hydrosulphite, the hydrosulphite being added to the cooled bath after about $\frac{1}{2}$ hour, and dye for another half hour or so.

Bleaching of Piece-Goods containing Effect Threads dyed with Hydron Colours.

For certain styles, more particularly for shirtings, unbleached yarn is woven up with dyed yarn, the fabric being then bleached in the piece. There are only few dyestuffs which will withstand this operation, and even with these, special precautions have to be taken in the bleaching. Pieces containing yarn dyed with Hydron Colours are treated as follows:

Boil the pieces for about one hour in a jigger containing 4—8 oz Turkey-red oil or monosolvol per 10 gallons, rinse, then bleach for a few hours in the customary manner with hypochlorite of soda of $\frac{3}{4}$ —1° Tw., rinse, acidify, and rinse once more thoroughly.

Then prepare a fresh bath containing $\frac{3}{4}$ —1½ oz sodium bisulphite per 10 gallons, treat the pieces therein for 15 to 20 minutes, rinse thoroughly, and finally soap lukewarm.

The following Hydron Colours are very well adapted for this treatment:

| | | |
|------------------|---|-------------|
| Hydron Blue | } | all brands. |
| Hydron Violet | | |
| Hydron Dark Blue | | |
| Hydron Yellow | | |

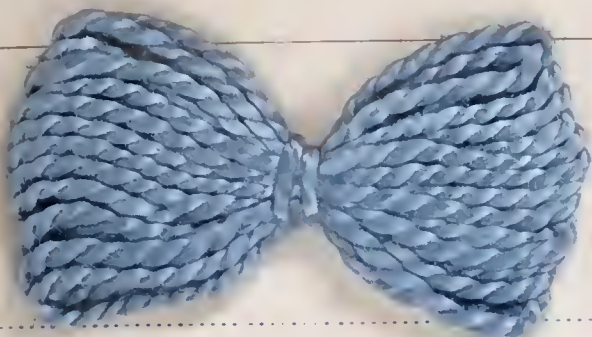
Sodium hypochlorite is prepared as follows:

100 lbs of chloride of lime 33% are rubbed down with cold water to 40 gallons, and 60 lbs of soda ash are dissolved in 20 gallons of hot water, this solution being diluted with 10 gallons of cold water and added to the paste of chloride of lime. The mixture is stirred for ½ hour and allowed to settle overnight. The clear solution is then drawn off and the precipitate washed four or five times with cold water, the wash water being used to dilute the solution to about 150 gallons of 6—7° Tw. It may be freed entirely from lime by the addition of 1—2 lbs soda ash, whereby the remainder of the lime is precipitated in the form of carbonate of lime. The solution reacts slightly alkaline.

Without guarantee.

Hydron Blue G pat.

1



0,7% Hydron Blue G pat. Paste 20%

5



3% Hydron Blue G pat. Paste 20%

2



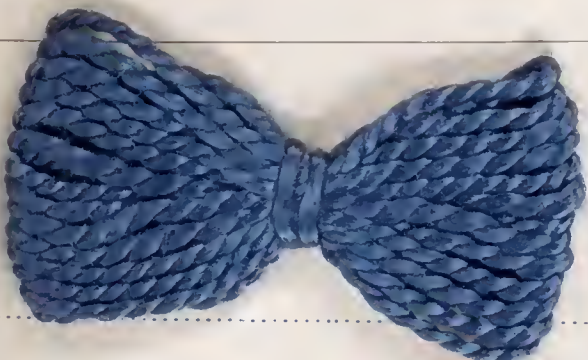
0,9% Hydron Blue G pat. Paste 20%

6



5% Hydron Blue G pat. Paste 20%

3



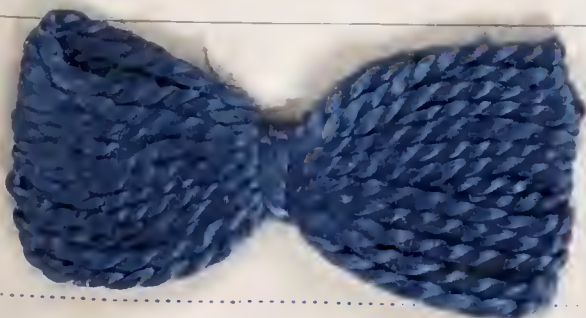
1,5% Hydron Blue G pat. Paste 20%

7



7,5% Hydron Blue G pat. Paste 20%

4



1,8% Hydron Blue G pat. Paste 20%

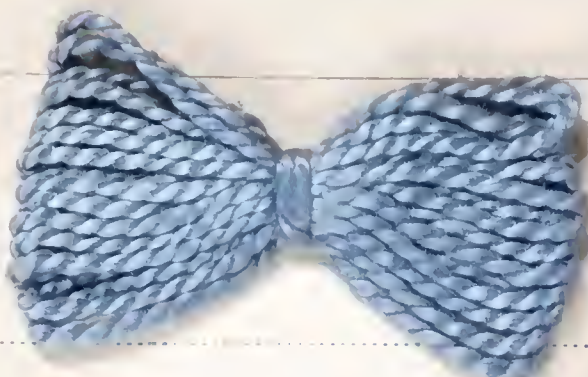
8



12% Hydron Blue G pat. Paste 20%

Hydron Blue B pat.

9



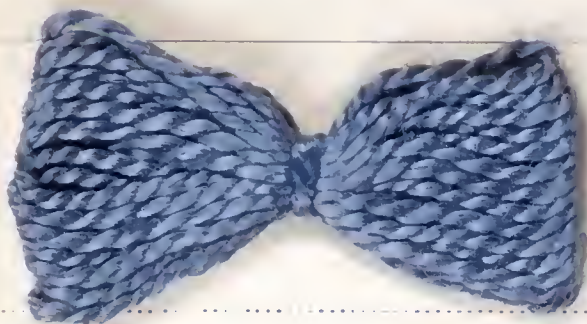
0,85% Hydron Blue B pat. Paste 20%

13



3,2% Hydron Blue B pat. Paste 20%

10



1,5% Hydron Blue B pat. Paste 20%

14



6% Hydron Blue B pat. Paste 20%

11



1,8% Hydron Blue B pat. Paste 20%

15



8% Hydron Blue B pat. Paste 20%

12



2,6% Hydron Blue B pat. Paste 20%

16



12% Hydron Blue B pat. Paste 20%

Hydron Blue R pat.

17



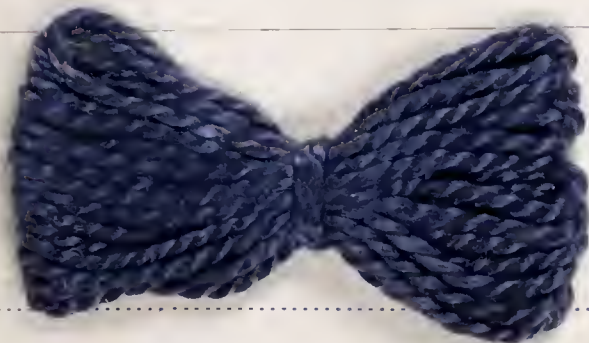
1,8 % Hydron Blue R pat. Paste 20 %

21



5,5 % Hydron Blue R pat. Paste 20 %

18



2,5 % Hydron Blue R pat. Paste 20 %

22



7,5 % Hydron Blue R pat. Paste 20 %

19



3,2 % Hydron Blue R pat. Paste 20 %

23



10 % Hydron Blue R pat. Paste 20 %

20



4 % Hydron Blue R pat. Paste 20 %

24



12 % Hydron Blue R pat. Paste 20 %

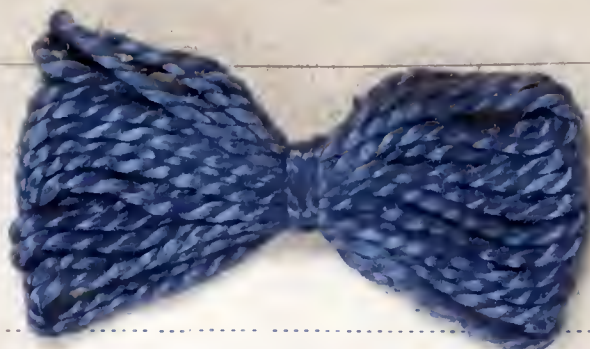
Hydron Blue treated with Perborate

25



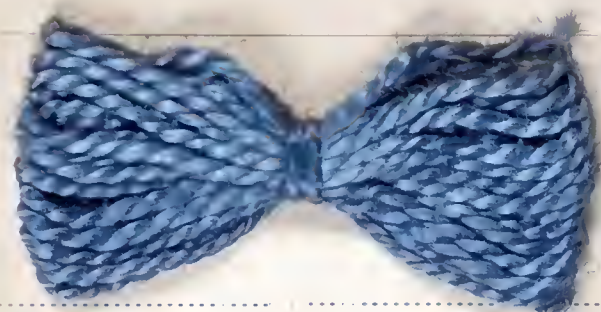
0,75 % Hydron Blue G pat. Paste 20 %

29



2,5 % Hydron Blue B pat. Paste 20 %

26



2 % Hydron Blue G pat. Paste 20 %

30



4 % Hydron Blue B pat. Paste 20 %

27



3 % Hydron Blue G pat. Paste 20 %

31



5 % Hydron Blue R pat. Paste 20 %

28



4 % Hydron Blue G pat. Paste 20 %

32



7,5 % Hydron Blue R pat. Paste 20 %

Hydron Dark Blue
G pat.

Hydron Violet
B pat.

33



3 % Hydron Dark Blue G pat. Paste 20 %

37



3,5 % Hydron Violet B pat. Paste 20 %

34



5 % Hydron Dark Blue G pat. Paste 20 %

38



5 % Hydron Violet B pat. Paste 20 %

35



9 % Hydron Dark Blue G pat. Paste 20 %

39



7,5 % Hydron Violet B pat. Paste 20 %

36



14 % Hydron Dark Blue G pat. Paste 20 %

40



10 % Hydron Violet B pat. Paste 20 %

Hydron Colours on Cotton Yarn (Self Shades)

Hydron Violet R pat.

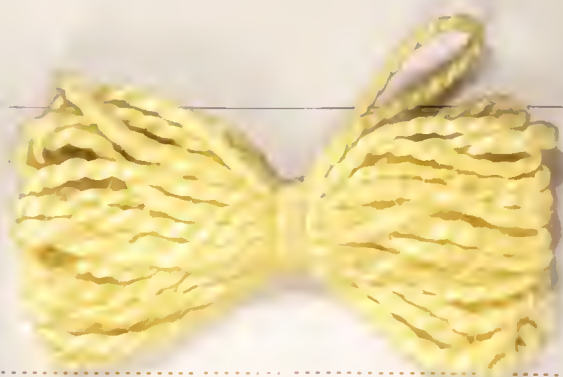
Hydron Yellow G pat.

41



3% Hydron Violet R pat. Paste 20%

45



3,5% Hydron Yellow G pat. Paste 20%

42



5% Hydron Violet R pat. Paste 20%

46



6% Hydron Yellow G pat. Paste 20%

43



8% Hydron Violet R pat. Paste 20%

47



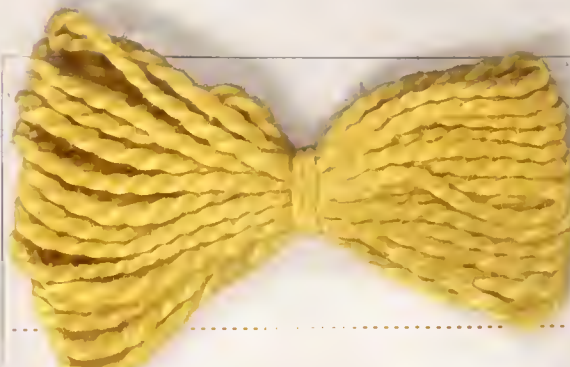
10% Hydron Yellow G pat. Paste 20%

44



12% Hydron Violet R pat. Paste 20%

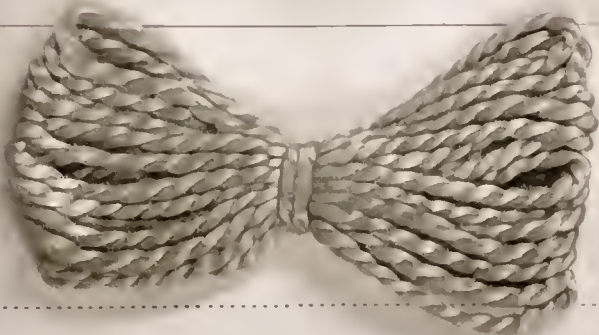
48



16% Hydron Yellow G pat. Paste 20%

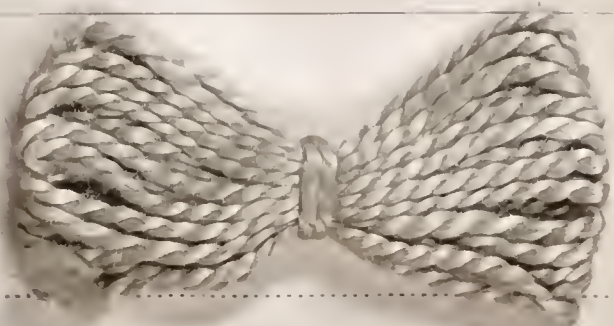
Hydron Olive pat. G and B

49



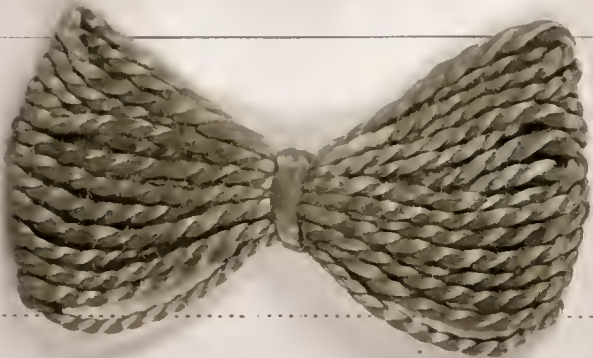
0,3% Hydron Olive G pat. Powder

53



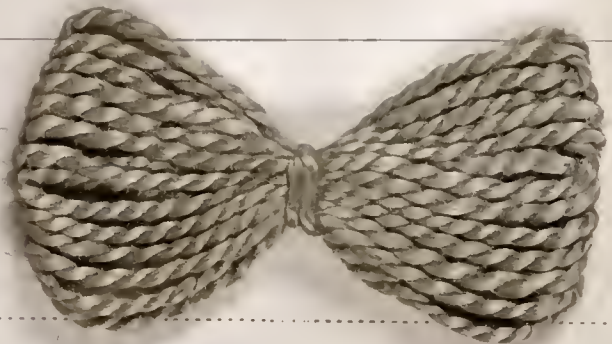
0,25% Hydron Olive B pat. Powder

50



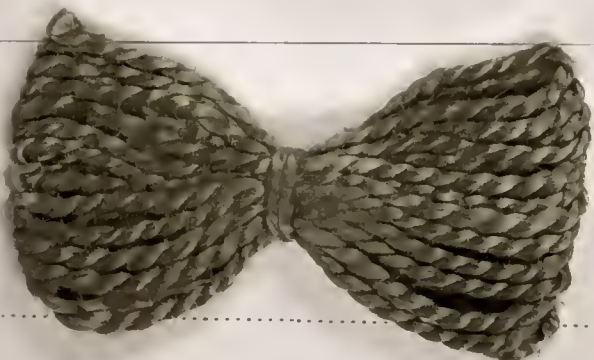
0,5% Hydron Olive G pat. Powder

54



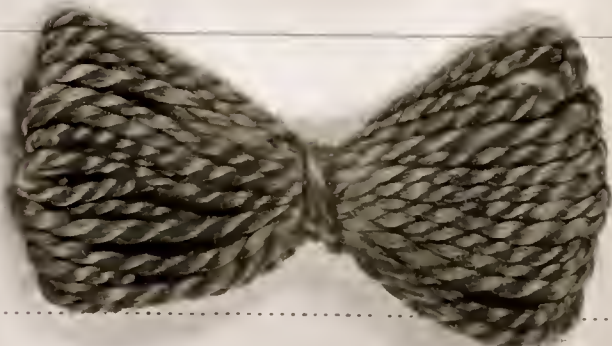
0,5% Hydron Olive B pat. Powder

51



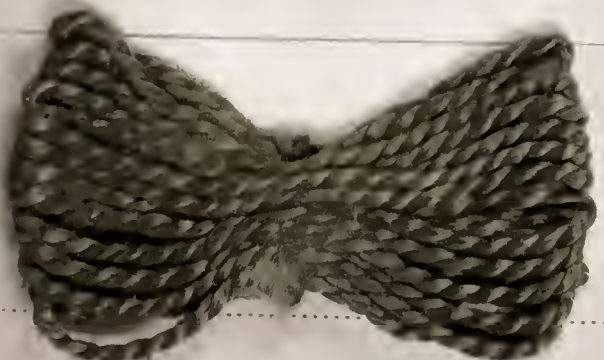
1,2% Hydron Olive G pat. Powder

55



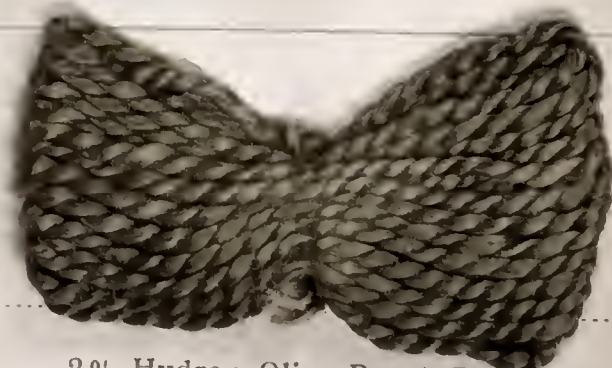
1,2% Hydron Olive B pat. Powder

52



2% Hydron Olive G pat. Powder

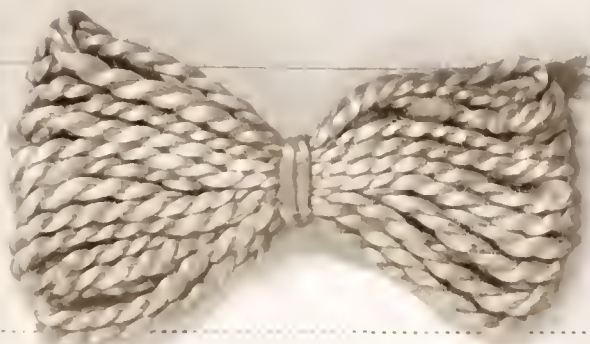
56



2% Hydron Olive B pat. Powder

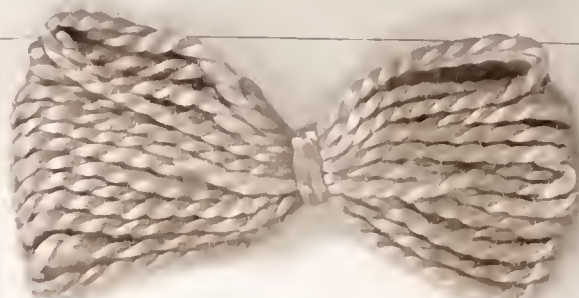
Hydron Brown pat. OG and OB

57



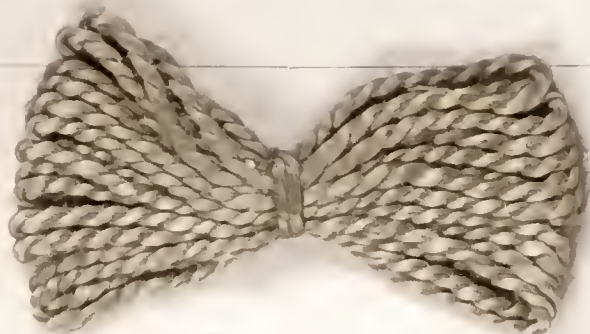
0,3% Hydron Brown OG pat. Powder

61



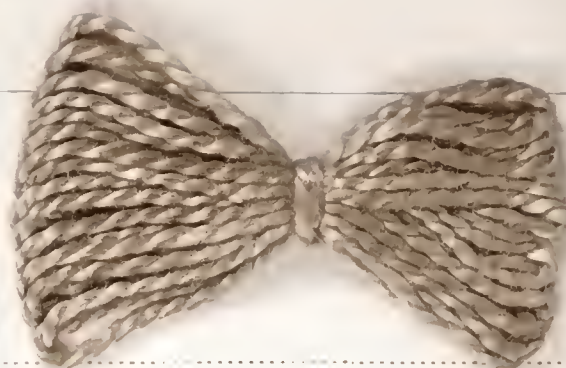
0,3% Hydron Brown OB pat. Powder

58



0,5% Hydron Brown OG pat. Powder

62



0,5% Hydron Brown OB pat. Powder

59



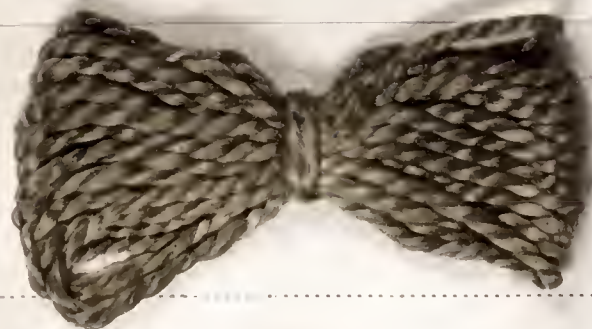
1% Hydron Brown OG pat. Powder

63



1% Hydron Brown OB pat. Powder

60



2,25% Hydron Brown OG pat. Powder

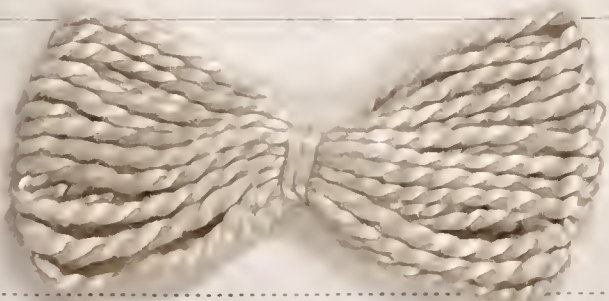
64



2,25% Hydron Brown OB pat. Powder

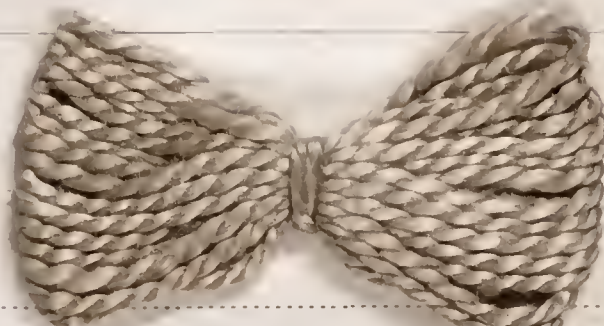
Khaki Shades

65



0,2 % Hydron Brown OB pat. Powder
0,07 % Hydron Yellow G pat. Paste 20 %

69



0,7 % Hydron Brown OB pat. Powder
0,07 % Hydron Yellow G pat. Paste 20 %

66



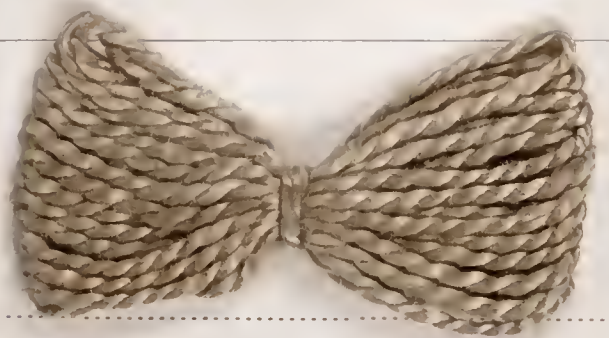
0,4 % Hydron Brown OB pat. Powder
0,1 % Hydron Yellow G pat. Paste 20 %

70



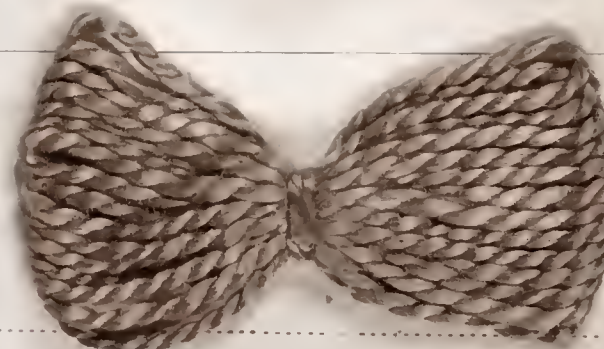
0,7 % Hydron Brown OB pat. Powder
0,2 % Hydron Yellow G pat. Paste 20 %

67



0,65 % Hydron Brown OB pat. Powder
0,16 % Hydron Yellow G pat. Paste 20 %

71



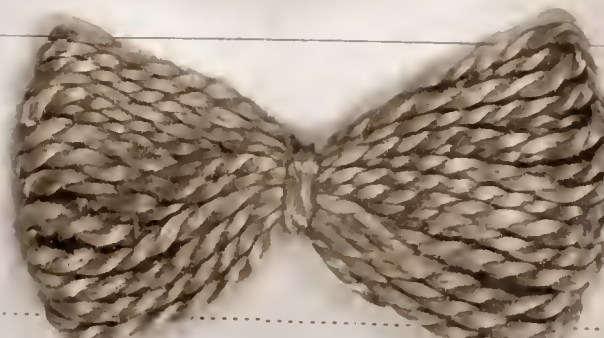
0,35 % Hydron Brown OG pat. Powder
0,35 % Hydron Brown OB pat. Powder
0,08 % Hydron Blue G pat. Paste 20 %

68



1 % Hydron Brown OB pat. Powder
0,6 % Hydron Yellow G pat. Paste 20 %

72



0,8 % Hydron Brown OB pat. Powder
0,07 % Hydron Yellow G pat. Paste 20 %

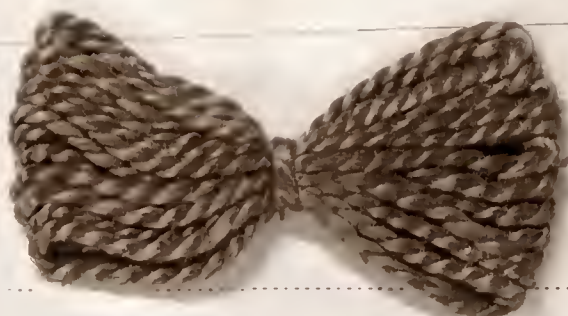
Hydron Colours on Cotton Yarn (Mixed Shades)

73



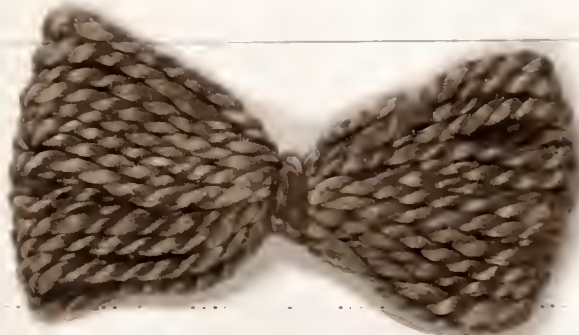
0,7 % Hydron Brown OG pat. Powder
0,7 % Hydron Yellow G pat. Paste 20 %

78



1 % Hydron Brown OB pat. Powder
0,1 % Hydron Yellow G pat. Paste 20 %

74



1,6 % Hydron Brown OB pat. Powder
1,3 % Hydron Yellow G pat. Paste 20 %

79



1,7 % Hydron Brown OG pat. Powder
0,2 % Hydron Blue G pat. Paste 20 %

75



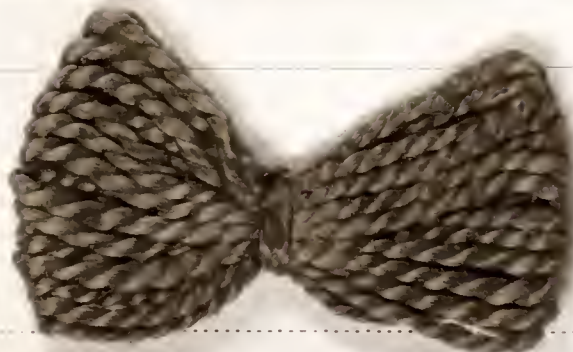
1 % Hydron Brown OG pat. Powder
0,16 % Hydron Yellow G pat. Paste 20 %

80



2,6 % Hydron Brown OB pat. Powder
1,3 % Hydron Yellow G pat. Paste 20 %

76



1,5 % Hydron Brown OG pat. Powder
0,25 % Hydron Blue G pat. Paste 20 %

81



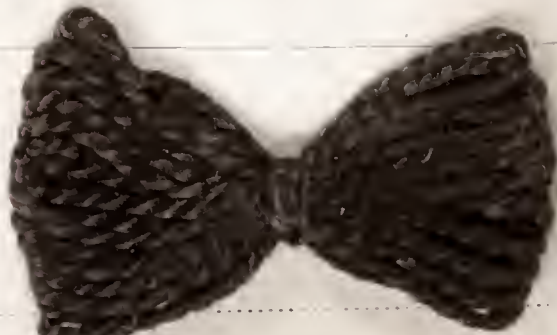
2,3 % Hydron Brown OG pat. Powder
0,5 % Hydron Blue G pat. Paste 20 %

77



2 % Hydron Brown OG pat. Powder
0,35 % Hydron Blue G pat. Paste 20 %

82



4 % Hydron Brown OB pat. Powder
8 % Hydron Yellow G pat. Paste 20 %

Hydron Colours on Cotton Yarn (Mixed Shades)

83



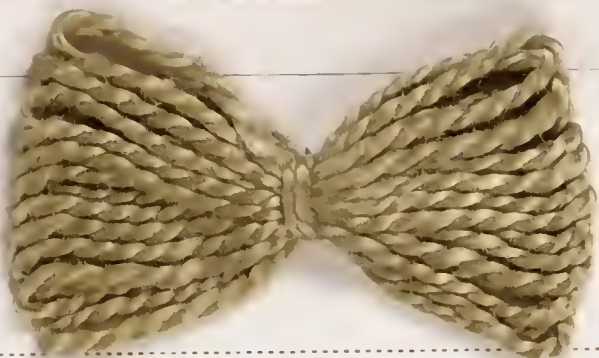
3,5 % Hydron Yellow G pat. Paste 20 %
0,2 % Hydron Olive G pat. Powder

88



10 % Hydron Yellow G pat. Paste 20 %
0,36 % Hydron Blue G pat. Paste 20 %

84



4 % Hydron Yellow G pat. Paste 20 %
0,5 % Hydron Brown OG pat. Powder

89



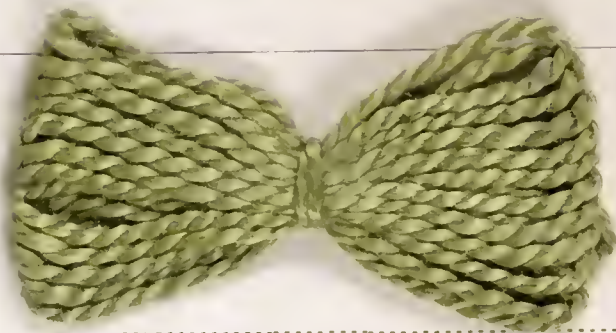
7 % Hydron Yellow G pat. Paste 20 %
0,75 % Hydron Blue G pat. Paste 20 %

85



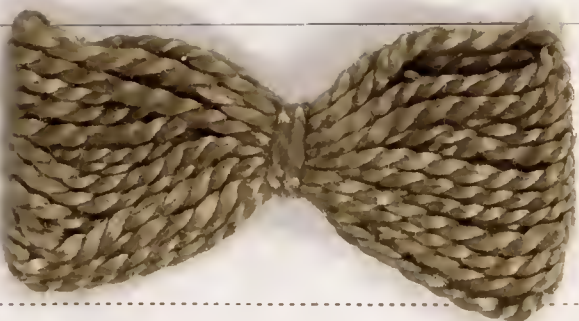
2 % Hydron Yellow G pat. Paste 20 %
0,85 % Hydron Brown OG pat. Powder

90



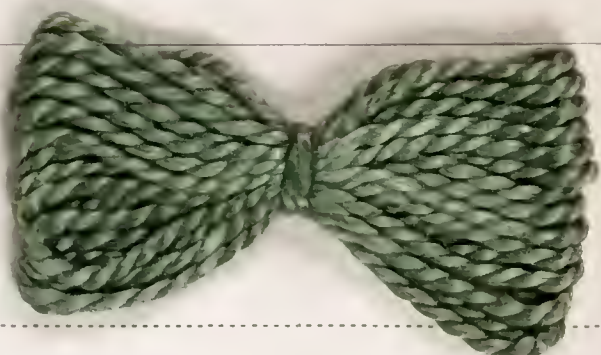
7 % Hydron Yellow G pat. Paste 20 %
1,4 % Hydron Blue G pat. Paste 20 %

86



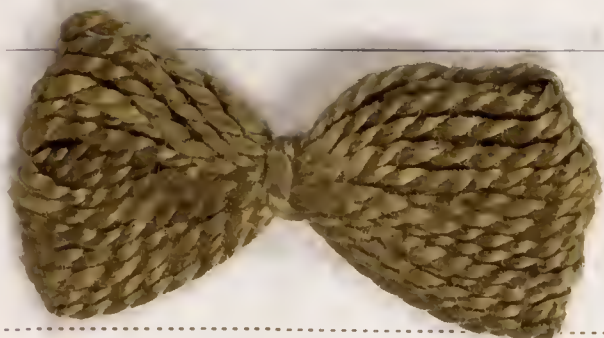
2,6 % Hydron Yellow G pat. Paste 20 %
1 % Hydron Brown OG pat. Powder

91



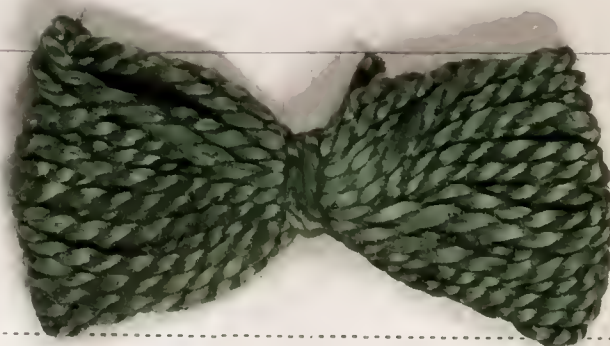
7 % Hydron Yellow G pat. Paste 20 %
2,6 % Hydron Blue G pat. Paste 20 %

87



7 % Hydron Yellow G pat. Paste 20 %
0,8 % Hydron Brown OG pat. Powder

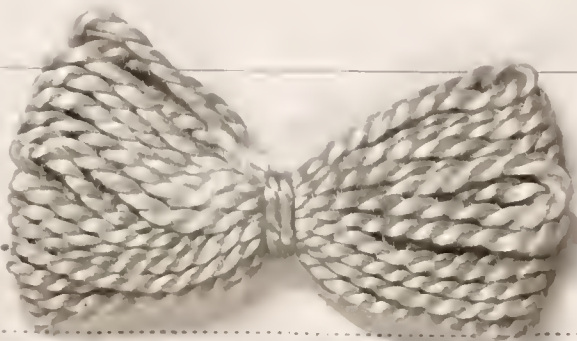
92



16 % Hydron Yellow G pat. Paste 20 %
6 % Hydron Blue G pat. Paste 20 %

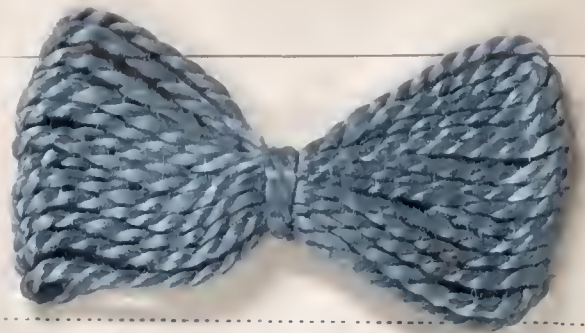
Hydron Colours on Cotton Yarn (Mixed Shades)

93



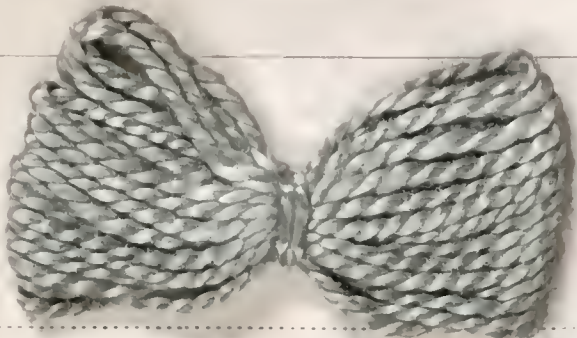
0,3 % Hydron Brown OG pat. Powder
0,07 % Hydron Blue G pat. Paste 20 %
0,05 % Hydron Yellow G pat. Paste 20 %

98



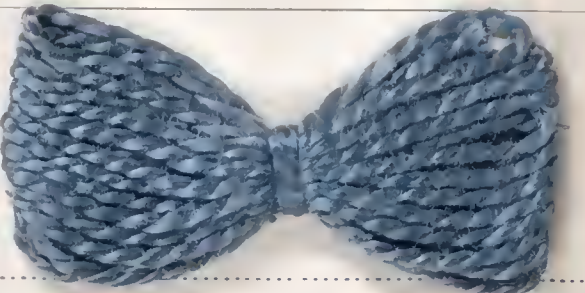
0,7 % Hydron Blue G pat. Paste 20 %
0,17 % Hydron Brown OG pat. Powder

94



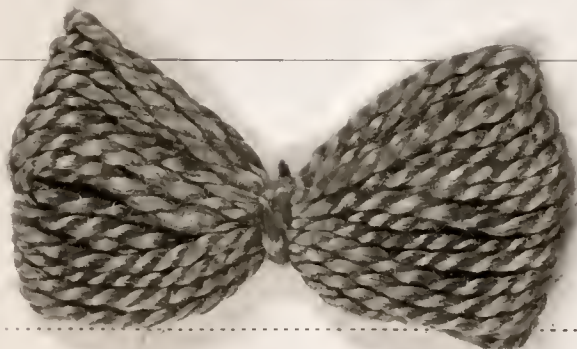
0,35 % Hydron Brown OG pat. Powder
0,35 % Hydron Blue R pat. Paste 20 %
0,35 % Hydron Yellow G pat. Paste 20 %

99



0,5 % Hydron Blue G pat. Paste 20 %
0,13 % Hydron Blue R pat. Paste 20 %
0,13 % Hydron Brown OG pat. Powder

95



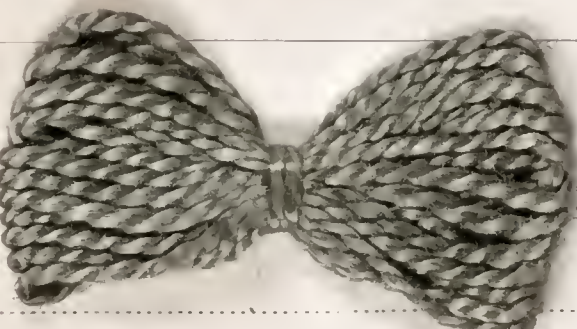
1 % Hydron Brown OG pat. Powder
0,4 % Hydron Blue G pat. Paste 20 %

100



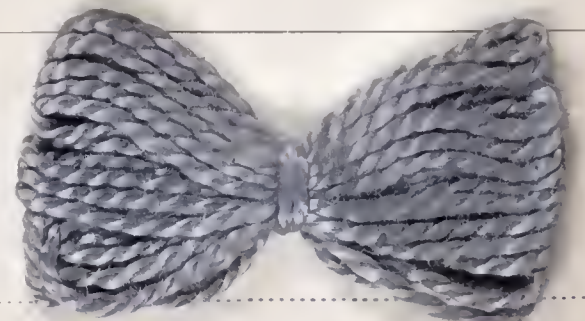
3,5 % Hydron Blue R pat. Paste 20 %
0,6 % Hydron Brown OG pat. Powder

96



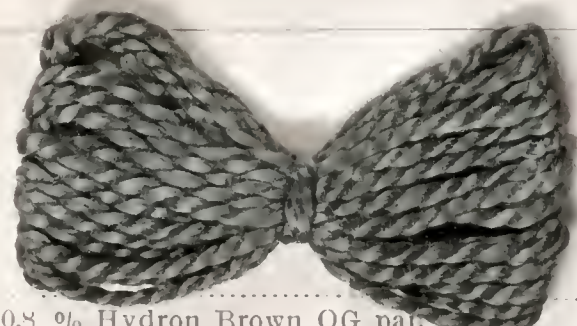
0,5 % Hydron Brown OG pat. Powder
0,55 % Hydron Blue R pat. Paste 20 %
0,5 % Hydron Yellow G pat. Paste 20 %

101



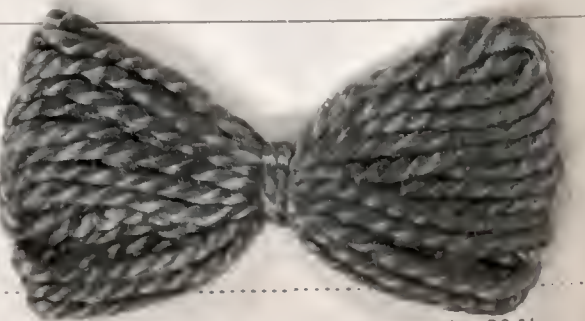
0,7 % Hydron Blue R pat. Paste 20 %
0,25 % Hydron Blue G pat. Paste 20 %
0,13 % Hydron Brown OG pat. Powder

97



0,8 % Hydron Brown OG pat.
0,85 % Hydron Blue R pat. Paste 20 %
0,35 % Hydron Yellow G pat. Paste 20 %

102



0,6 % Hydron Blue R pat. Paste 20 %
0,35 % Hydron Brown OG pat. Powder

Hydron Colours on Cotton Yarn (Mixed Shades)

103



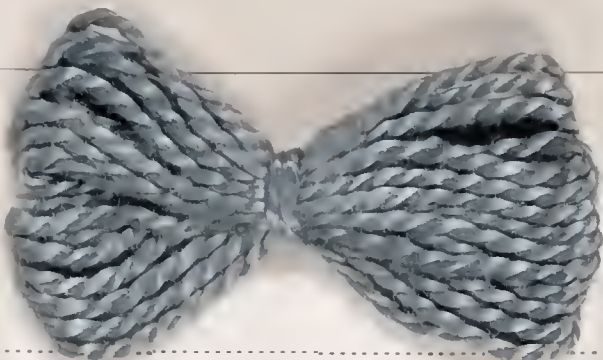
0,35 % Hydron Blue G pat. Paste 20 %
0,07 % Hydron Brown OG pat. Powder
0,07 % Hydron Yellow G pat. Paste 20 %

108



1 % Hydron Blue G pat. Paste 20 %
0,22 % Hydron Olive G pat. Powder

104



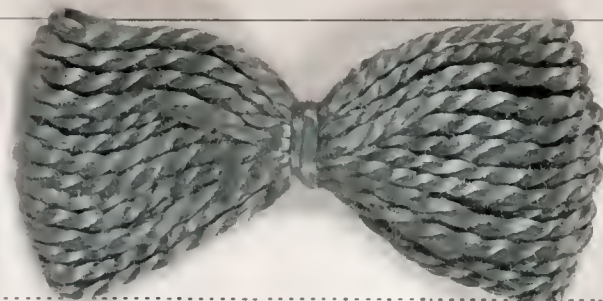
0,46 % Hydron Blue G pat. Paste 20 %
0,2 % Hydron Brown OG pat. Powder

109



1,3 % Hydron Blue G pat. Paste 20 %
0,17 % Hydron Olive G pat. Powder

105



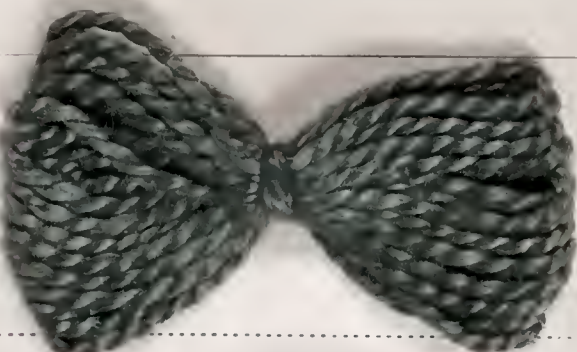
0,3 % Hydron Olive G pat. Powder
0,26 % Hydron Blue G pat. Paste 20 %

110



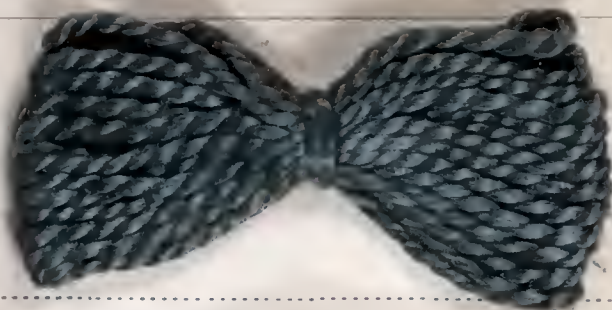
2 % Hydron Blue G pat. Paste 20 %
0,5 % Hydron Olive G pat. Powder

106



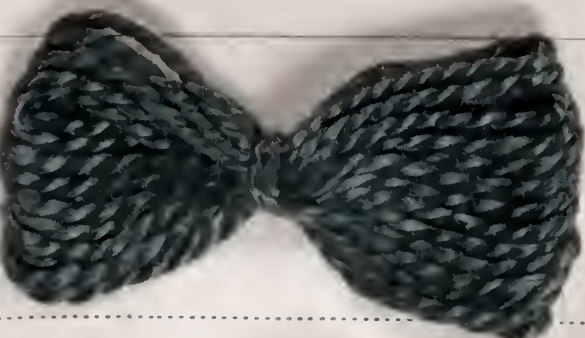
1,4 % Hydron Olive G pat. Powder
1 % Hydron Blue G pat. Paste 20 %

111



1,3 % Hydron Blue G pat. Paste 20 %
0,9 % Hydron Olive G pat. Powder

107



0,85 % Hydron Blue G pat. Paste 20 %
0,75 % Hydron Olive G pat. Powder

112



4,6 % Hydron Blue G pat. Paste 20 %
0,5 % Hydron Olive G pat. Powder

Hydron Colours on Cotton Yarn (Mixed Shades)

113



0,85 % Hydron Blue G pat. Paste 20 %
0,1 % Hydron Blue R pat. Paste 20 %

118



9 % Hydron Blue G pat. Paste 20 %
4,5 % Hydron Blue R pat. Paste 20 %

114



1,5 % Hydron Blue G pat. Paste 20 %
0,35 % Hydron Blue R pat. Paste 20 %

119



6 % Hydron Blue G pat. Paste 20 %
6 % Hydron Blue R pat. Paste 20 %

115



2,6 % Hydron Blue G pat. Paste 20 %
0,7 % Hydron Blue R pat. Paste 20 %

120



9 % Hydron Blue R pat. Paste 20 %
4,5 % Hydron Blue G pat. Paste 20 %

116



6 % Hydron Blue G pat. Paste 20 %
3 % Hydron Blue R pat. Paste 20 %

121



1 % Hydron Blue G pat. Paste 20 %
topped with One-Bath Aniline Black

117



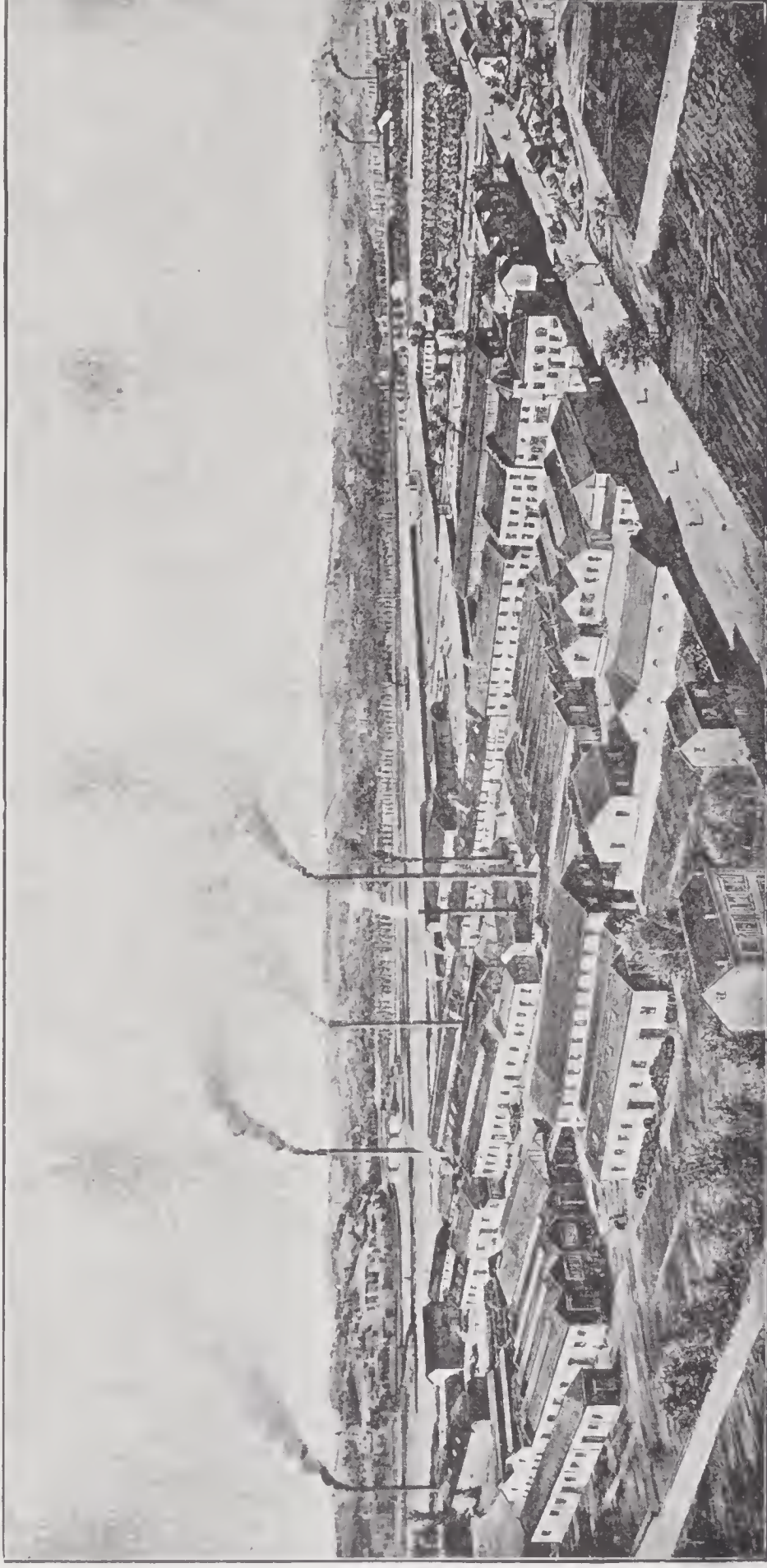
7,7 % Hydron Blue G pat. Paste 20 %
3,5 % Hydron Blue R pat. Paste 20 %

122



10 % Hydron Dark Blue G pat. Paste 20 %
topped with One-Bath Aniline Black.

MANUFACTURE LYONNAISE DE MATIÈRES COLORANTES, LYONS.



Works "La Mouche".

RUSSIAN ANILINE COLOUR WORKS LEOPOLD CASSELLA & Co., RIGA.



Works at Riga.

SPECIAL

87-B
11975

